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# Providing the Connection:

AirLink

## ***Wireless Data Networks***

AirLink systems provide remote connectivity in a wide range of private and public data networks. Systems can be deployed in hub, repeater and endpoint configurations to implement point-to-point or multipoint data networks. Banking networks use AirLink to connect ATM terminals. Point-of-sale and gaming networks consolidate traffic from multiple terminals and use AirLink for transmission to off-site transaction processing centers. Internet service providers are using the wide range of AirLink products to supply connectivity worldwide. AirLink systems enable corporations to build private wireless networks that span anything from parking lots to entire countries. By using digital technologies, these networks can transport data or voice traffic with equal efficiency.



## ***Country-Wide Network Reaches Growers***

A large international fruit company recently set up a nationwide network to support farming operations in Latin America. Public carrier circuits were employed as the backbone, but connecting the carrier's points of presence to plantation sites required wireless communications. The company built an entire coast-to-coast corporate data network operating at 64 kbit/s using AirLink systems and Cisco routers. The wireless network pushes just-in-time ordering principles to growers by allowing inventory to be picked as orders are received, barcoded and tracked en route to the customer.

## ***Wireless Replaces Noisy Wiring***

Faced with a noisy wiring plant that handles voice but not data, the Costa Rica telephone company established a hilltop hub site with line-of-sight access to businesses in the capital city of San Jose. All of the traffic coming into the site across low-speed links is multiplexed into a single fractional T1 circuit and backhauled over a larger AirLink circuit to the central office. This allows the telephone company to immediately provision valuable customers while the effort to upgrade cable continues at a normal pace.



# AirLink™ in Data Communications

## ***Delivering E-mail via the Internet***

In Armenia, a strong demand exists to supply Internet connections to the business and academic communities, but the limited telecommunications infrastructure restricts wireline access to e-mail service that the Internet provides. To deliver the service, a network operator built an earth station as a gateway to the Internet. Individual connections to the Internet's e-mail backbone are provided using AirLink systems fanning out from the earth station.

## ***Helping Schools Go Online***

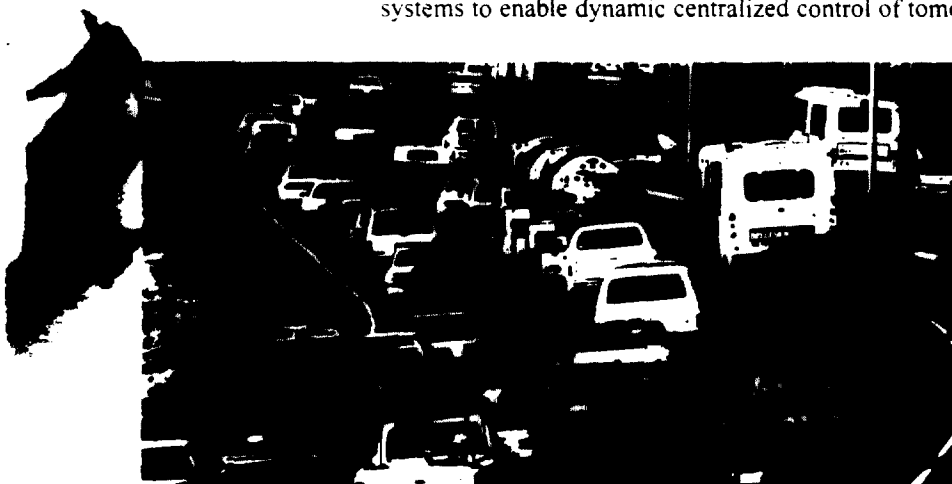
U.S. school administrators are being directed to bring their networks on-line with the Internet. But economic policies make it inconvenient for each school to establish a separate Internet connection resulting in multiple repetitive charges. In order to reduce this problem,

- AirLink systems are increasingly used to network schools together to share Internet gateways. This one-time capital outlay is considered more acceptable to school officials than duplicated connection expenses.



## ***Managing Transportation Networks***

AirLink systems are adopted and integrated by leading manufacturers of traffic control systems to enable dynamic centralized control of tomorrow's highways.



### *Synchronized signals:*

Federal programs are underway to coordinate traffic signal lights along heavily traveled corridors to reduce idle time. AirLink systems are deployed for permanent or temporary connection to traffic flow measurement devices. Wireless communication is the preferred method to connect devices as it is rapidly deployable and is not vulnerable to interruptions from frequent construction projects.

### *Intelligent highways:*

New highway systems use rush hour cameras and pressure sensitive loops in-road to detect traffic flow, metering lights to control traffic, and overhead electronic displays for real-time traffic information. AirLink systems allow these widely dispersed elements to communicate without digging up roadbeds to lay new communication lines.

# Providing the Connection # Air

## ***Expanding the Communications Infrastructure***



Cylink is helping carriers realize the goal of allowing people to communicate with one another, anytime, anywhere.

Potential telephone customers in many rural areas remain unserved by wire due to capital costs, time to deploy, or physical barriers. Radio-based infrastructures significantly reduce or eliminate such drawbacks. These networks cost far less to install than physical connections and readily circumvent most obstacles while providing more rapid expansion of services. When AirLink systems are deployed for temporary use in the local loop, they can be moved and redeployed to new locations as the copper infrastructure catches up.

AirLink provides facilities for the delivery of telephony in combination with traditional voice equipment such as channel banks, key systems and PBXs. Cylink's wide range of AirLink microwave systems allow scalability from a single line to E1 capacity.

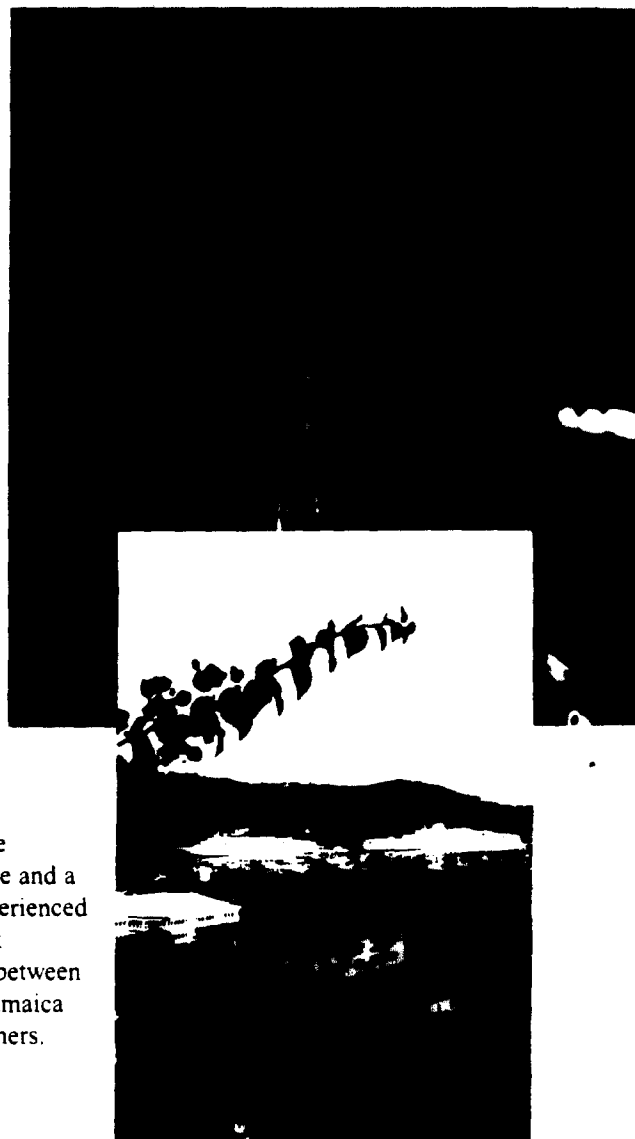
Whether building a private data network, or extending phone service to a remote village, AirLink systems allow network operators to quickly provide service to locations that would otherwise be inaccessible.

### ***WLL (Wireless Local Loop) Connects Remote Villages***

The Pakistan Telecom Corporation has a mandate to install thousands of telephone lines to remote villages that have never had service. In order to meet time and quality-of-service provisions in the mandate, they chose AirLink as part of their pay phone system design. AirLink systems can be deployed rapidly to temporarily connect phone sites and then redeployed to more distant locations as the wired network expands to absorb the previous site.

### ***Reaching Business When Limited Wiring Can't***

As part of a program to upgrade their infrastructure, the Jamaica Telephone Company recently purchased a modern fiber backbone, a new central office and a state-of-the-art switch. Yet with a limited wiring plant, businesses still experienced difficulty accessing voice services. The solution involved 64 kbit/s AirLink wireless links - each delivering 8 channels of compressed 8 Kbit/s voice - between the remote customers and the central office. The AirLink systems allow Jamaica telephone to reach beyond existing wiring to provide service to new customers.



# AirLink™ in Voice Communications

## ***Providing Cell Interconnect For PCS***

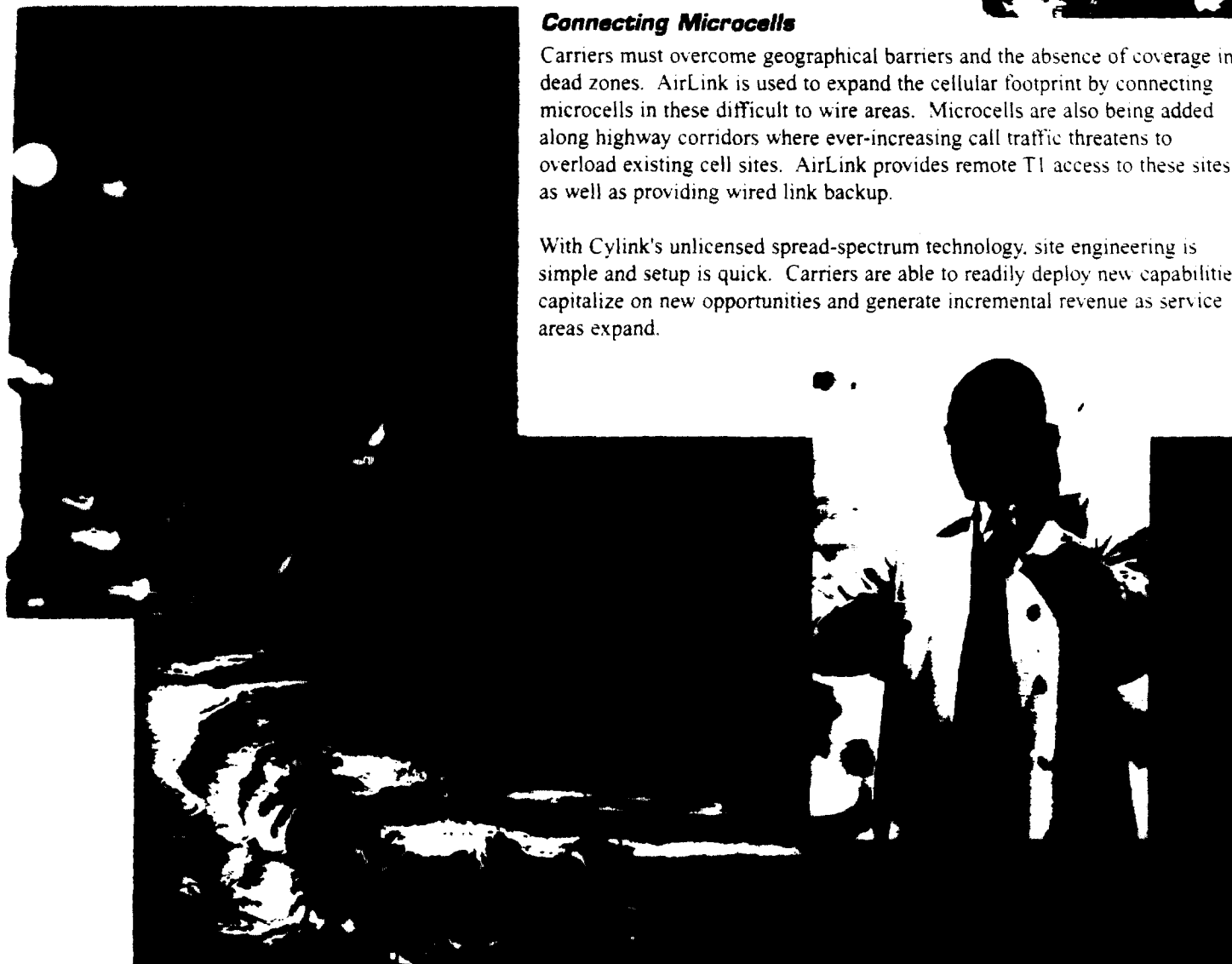
The rapid expansion of PCS (Personal Communication Services) requires construction of thousands of new microcells. The placement of cells is dictated by the area that must be covered, not by the convenience of routing backhaul connections to the site. Because of this, cells have been located on top of power poles, bridges, and other prominent structures. Network builders need to connect these cells to the service provider's point of presence, but many cells are difficult to reach by wire. To offer immediate access, a major PCS supplier in the US selected the AirLink T1. With the delivery of T1 over microwave, AirLink allows connectivity in out-of-the-way locations providing for rapid and cost effective infrastructure expansion.



## ***Connecting Microcells***

Carriers must overcome geographical barriers and the absence of coverage in dead zones. AirLink is used to expand the cellular footprint by connecting microcells in these difficult to wire areas. Microcells are also being added along highway corridors where ever-increasing call traffic threatens to overload existing cell sites. AirLink provides remote T1 access to these sites as well as providing wired link backup.

With Cylink's unlicensed spread-spectrum technology, site engineering is simple and setup is quick. Carriers are able to readily deploy new capabilities, capitalize on new opportunities and generate incremental revenue as service areas expand.



***What do thousands of installations in  
countries around the world have in common?***  
**AirLink™ Wireless Communications for Voice and Data**

*Cylink Corporation is a leader in wireless communications and the world's largest provider of enterprise-wide network information security products. Headquartered in Sunnyvale, California, Cylink serves Fortune 500 companies, multinational corporations and many government agencies.*

**Other Cylink locations throughout the USA include:**  
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# AIRLINK T1/E1

**AIRLINK**

FAST, ROBUST, COST-EFFECTIVE WIRELESS COMMUNICATIONS



**DCYLINK**

*Get Connected. Almost  
Anywhere. To Almost  
Anything...*



Running cable from a remote location to a satellite earth station or fiber backbone can be a non-trivial exercise. Often the process raises serious issues of cost and reliability.

But you don't have to face them, because there is a reliable, economical alternative. To get your communications program off the ground and solidly linked to your service provider's network, get airborne with AirLink. AirLink wireless communications provide a simple and inexpensive "last mile" solution.

Cylink antennas easily mount on a roof or mast. AirLink E1/T1 modems can be mounted indoors or outdoors under the antenna. The AirLink E1/T1 has industry-standard interfaces for direct connection to PBXs, multiplexers, routers, bridges, channel banks, and other common communications link components.

*Immediately...*

If you need service RIGHT NOW, and you can't get a cable in fast enough, get connected with AirLink. You'll be amazed at how quickly — and easily — the AirLink E1/T1 can have you up and running.

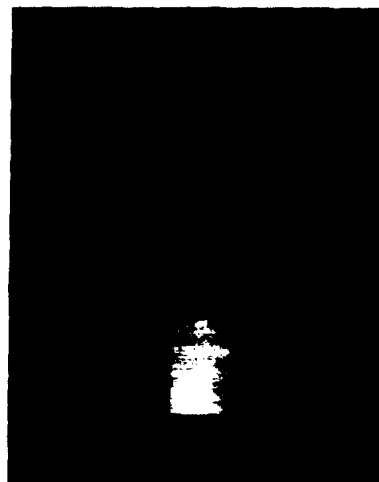
*With instant, software-controlled configuration.*

The AirLink T1/E1 is the first software-controlled spread-spectrum microwave modem. All the configuration is done by the installer on the spot.

To set the RF (radio frequency) output power, the installer just types it. No need to wait for the system to warm up. The software and the hardware ensure that the value typed in is the power transmitted.

To verify the communications link, technicians simply check the number of errored seconds, RF power level being received, the quality of the received signal, the alarm log, and other pertinent parameters without disturbing the T1 or E1 payload. Self test and loopback tests are built in, so the technician doesn't even need to carry test equipment.

Once the local AirLink is running smoothly, what about the far end? No need to travel to the other end



of the link to find out. Just enter the remote commands. The far-end AirLink will respond using the supervisory channel between the radios. Again, this is done without disturbing the payload.

That's the value of software-controlled AirLink radios. It's all so fast and easy.

*Spread-spectrum robustness,  
proven in 10,000 installations  
worldwide,...*

Incorporating spread spectrum technology, Cylink's modem is virtually immune to interference from other modems operating in the Industrial, Scientific & Medical (ISM) frequency bands. It is also inherently private and not detectable by consumer-type scanners.

And it's tough. Hostile environments present no challenge to this box.

In the unlikely event of a failure, a spare AirLink can be installed in minutes. Enter a few software configuration instructions and you're up and running again. There are no circuit boards to move around and no jumpers to set.

With fewer spare units needed to support a large network, Airlink brings the life-cycle cost of ownership of the network down significantly.



Cylink's spread spectrum microwave technology has been proven robust by over 10,000 modems installed around the world. When the going gets tough, the tough take to the airwaves — with AirLink.

### *Superior performance.*

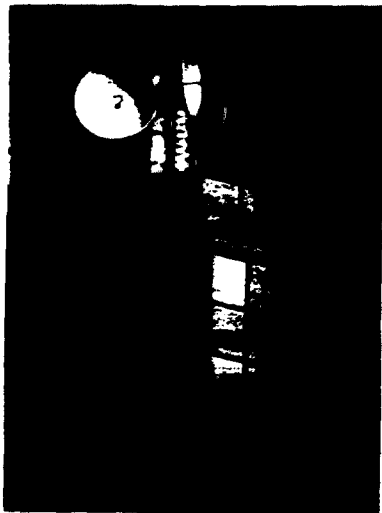
When interruptions or noise and bit errors on your wireline service become excessive, have a look at how well AirLink solves your problem.

AirLink modems beat the problems associated with long wire runs and frequent interruptions. Highly reliable service and superior performance come with every AirLink you install.

### *Interconnect Offices...*

Rapid growth is exciting, but the growing pains can be excruciating. Just keeping all those new people in touch with each other is a serious challenge.

The solution is AirLink T1/E1.



When your site starts expanding into a campus and you're having trouble getting communications established in a timely manner, or the phone bill keeps rising just to maintain

interbuilding communications, AirLink microwave radios are your best alternative.

Whether the branch office is across the street, across the river, or over 20 miles (35 km) out of town, if you can see it, AirLink radios can reach it.

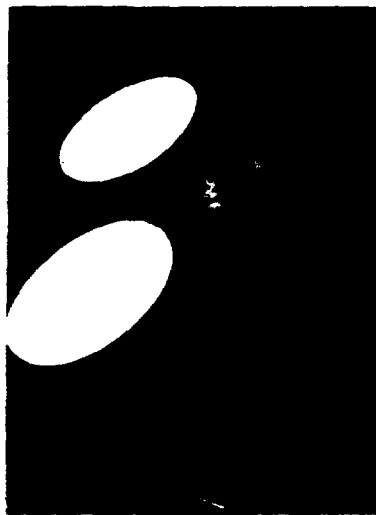
Swapping files, forwarding voicemail, video conferencing — it's all part of the capabilities you get with the AirLink T1/E1. Airlink T1 and E1 modems supply respectively 1.5 and 2.0 megabit

full-duplex communication channels between routers, bridges or multiplexers connected to the segments of your LANs (local area networks). The AirLink radios are transparent to the protocols used.

### *Connect cellular, SMR, PCS, or paging microcells...*

AirLink is a natural for a variety of specialized communications needs:

- Minicell and microcell sites carrying a small amount of traffic are best served by a single T1 or E1 trunk with an AirLink radio.
- Two-way paging creates a growing need for many receiver sites that AirLink fills admirably.
- Specialized Mobile Radio (SMR) and personal communications services (PCS) have similar cell sites and usually need only the thin back bone provided by an AirLink modem.



Located on hilltops or building peaks, these sites are often easier to reach by microwave radio than by cable. The AirLink family is the "best-value" solution.

### *And rural sites.*

Many towns, villages, and work sites are too difficult to reach with cable, but easily reached by microwave radio. Place an AirLink T1/E1 in the village, put a repeater on the mountaintop and you have created a full T1 or E1 connection to the city. Now there's cost-effective communications.

*Cost-effective communications solutions begin with AirLink wireless networks.*

# *Wireless Communications at 1.544 and 2.048 Mbps with Cylink's AirLink T1 and E1 Microwave Radios*

- Get Connected— from Almost Anywhere to Almost Anything...
- Immediately...
- With instant, software-controlled configuration.
- Spread-spectrum robustness, proven in 10,000 installations worldwide,...
- Exceeds wireline performance.
- Interconnect Offices...
- Connect cellular, SMR, PCS or paging microcells...
- and rural sites.

*Cylink Corporation is a leader in wireless communications,  
and the world's largest provider of enterprise-wide network  
information security products. Headquartered in Sunnyvale,  
California, Cylink serves Fortune 500 companies,  
multinational corporations and many government agencies.*

Other Cylink locations throughout the USA include:  
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Colorado and Illinois.

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